M.R.O. 1—77,006—8-6-37.

(1) Number of pages 30

(2) Date of repair

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 929 Press ~~Mis.~~

181-82

Dated 29. 4- 1871.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department,
29th March 1871.

Read the following papers :—

No. 681. From R. SMITH, Esq., Executive Engineer, on special duty, Madura District, to the Chief Engineer for Irrigation, dated Madura, 8th March 1871, No. 415 :—

I HAVE the honour to submit the usual Monthly Report showing the progress made with the Perryaur investigations during February 1871.

1 Table of Rain-fall and Discharge of Perryaur.
1 Diagram of do. do.

2. All work connected with the detailed examination of sites Nos. 2 and 3 has been completed. Lieutenant Greer, who was in immediate charge of the operations in the hill tracts, returned to Madura on the 7th ultimo, and has since been engaged in working out the cost of the water-shed tunnel and lake embankment at different levels.

3. During my visit to the Perryaur, at the close of last year, I resolved on having the water-shed and country adjacent to the Goodalore Ghaut examined, before submitting the estimate and designs for the head works, and assigned this duty to Lieutenant Christie.

4. The results of this examination indicate that the reservoir embankment should be constructed some 8 or perhaps 10 miles below our present proposed sites.

5. As the unhealthy season was close at hand, Lieutenant Christie's investigations were necessarily very cursory, but you will, I presume, consider from what has been ascertained that further investigation is necessary.

6. According to Lieutenant Christie's levels the fall in the bed of the Perryaur, from the present camp to the embouchure of the stream on the right bank of this river, in longitude 77° 13' is 35·19 feet; and from this point to about 3 miles farther down there is very little, if any, slope. From the end of this level reach Lieutenant Christie took a section about a mile in length, and found the fall to be 10 feet in this distance. He also examined the river for a mile or so lower down, and reports that there will be no difficulty in finding a suitable site for the lake embankment in that locality.

7. Lieutenant Christie makes the crest of the water-shed near Goodalore, 49·75 feet lower than it is in the line of the present proposed out-fall from sites 2 and 3.

8. If the detailed investigations confirm the above results, the head works will probably cost less than they would do higher up. The risk during construction and subsequently will be considerably reduced by having the reservoir in this comparatively flat country, and the increased area of the catchment basin will make the supply of water much more certain.

In November last experiments were made by Lieutenant Greer, at my request, to ascertain the proportion of silt brought down by the Perryaur during floods. Annexed are the results :—

State of River.	Level of River.	Weight of silt brought down by one cubic foot of water.	Specific gravity of silt.	Cubical contents of silt brought down by one cubic foot of water.
Flood rising	5 feet.	12 grs.	2	0·02 inch.
Top of flood	10 ,,	22 ,,	2	0·04 ,,
River falling	5 ,,	7 ,,	2	0·01 ,,

10. The table and diagram showing the rain-fall at the Perryaur camp, and the discharge of the Perryaur during February 1871, accompany this report.

11. Fair progress has been made with the designs for the works on the north of the Vigay, and with the survey of the distribution channels. Subjoined is an abstract of the field-work done in the plains during the month under review :—

Lineal miles of country surveyed.	Levelling operations. Aggregate length of longitudinal and transverse sections in miles.	Number of permanent bench-marks fixed.	Number of trial-pits sunk to the full depth.
122	81	21	113

12. In conclusion, I have to add that Lieutenant Christie has volunteered to remain on the Perryaur staff, for a time, in the event of your considering it desirable to resume the investigations lately conducted by him, and I feel sure the Government will appreciate the spirit that prompted this offer and allow him to continue on special duty.

PERRYAUR PROJECT.

Table of Rain-fall and Discharge of Perryaur during February 1871.

Date.	Rain-fall at Perryaur Camp.	Hours.	Water level in feet.	Discharge. Cubic feet per second.	Discharge. 1,000 Cubic yards per day.
	Inches.				
1st February...	0·00	6 A. M.	0·30	396	1,267
		6 P. M.	0·30	396	
2nd do. ...	0·00	6 A. M.	0·25	384	1,228
		6 P. M.	0·25	384	
3rd do. ...	0·00	6 A. M.	0·20	372	1,173
		6 P. M.	0·15	361	
4th do. ...	0·00	6 A. M.	0·10	349	1,101
		6 P. M.	0·05	339	
5th do. ...	0·00	6 A. M.	0·00	328	1,037
		6 P. M.	—0·04	320	
6th do. ...	0·00	6 A. M.	—0·08	312	995
		6 P. M.	—0·09	310	
7th do. ...	0·00	6 A. M.	—0·10	308	979
		6 P. M.	—0·12	304	
8th do. ...	0·00	6 A. M.	—0·14	300	954
		6 P. M.	—0·16	296	
9th do. ...	0·00	6 A. M.	—0·20	289	915
		6 P. M.	—0·23	283	
10th do. ...	0·00	6 A. M.	—0·21	287	909
		6 P. M.	—0·24	281	
11th do. ...	0·00	6 A. M.	—0·25	279	883
		6 P. M.	—0·28	273	
12th do. ...	0·00	6 A. M.	—0·29	271	864
		6 P. M.	—0·30	269	
13th do. ...	0·00	6 A. M.	—0·30	269	1,126
		12 NOON.	0·42	426	
		6 P. M.	0·15	361	

Table of Rain-fall and Discharge of Perryaur, etc.—(Concluded.)

Date.	Rain-fall at Perryaur Camp.	Hours.	Water level in feet.	Discharge.	
				Cubic feet per second.	1,000 Cubic yards per day.
	Inches.				
14th February...	0·00	6 A. M. / 6 P. M.	0·30 / 0·35	396 / 408	1,286
15th do. ...	0·00	6 A. M. / 6 P. M.	0·15 / 0·00	361 / 328	1,102
16th do. ...	0·31	6 A. M. / 6 P. M.	0·20 / —0·04	372 / 320	1,107
17th do. ...	0·00	6 A. M. / 6 P. M.	—0·16 / 0·08	296 / 345	1,026
18th do. ...	0·08	6 A. M. / 6 P. M.	—0·16 / 0·20	296 / 372	1,069
19th do. ...	0·00	6 A. M. / 6 P. M.	0·10 / —0·08	349 / 312	1,058
20th do. ...	0·00	6 A. M. / 6 P. M.	—0·20 / 0·30	289 / 396	1,096
21st do. ...	0·00	6 A. M. / 6 P. M.	—0·14 / —0·16	300 / 296	954
22nd do. ...	0·00	6 A. M. / 6 P. M.	—0·23 / —0·28	283 / 273	890
23rd do. ...	0·00	6 A. M. / 6 P. M.	—0·30 / —0·33	269 / 263	851
24th do. ...	0·00	6 A. M. / 6 P. M.	—0·39 / —0·39	251 / 251	803
25th do. ...	0·00	6 A. M. / 6 P. M.	—0·40 / —0·43	249 / 243	787
26th do. ...	0·02	6 A. M. / 6 P. M.	—0·50 / —0·50	229 / 229	733
27th do. ...	0·40	6 A. M. / 6 P. M.	—0·52 / —0·43	225 / 243	749
28th do. ...	0·20	6 A. M. / 6 P. M.	—0·33 / —0·33	263 / 263	842
Total...	1·01	......	......	......	27,784

Depth run off from Catchment Basin of 250 square miles = 1·29 inches.

Mean Discharge ... { 992,285 Cubic yards per diem.
41,345 ,, ,, per hour.
310 ,, feet per second.

	Cubic yards.
Discharge of Perryaur in February 1871	27,784,000
Do. of do. in do. 1870	25,566,000
Difference—Excess in February 1871 ...	2,218,000

(Signed) R. SMITH,
Executive Engineer on special duty.

MADURA,
8th March 1871.

No. 681 A. Memorandum by the Chief Engineer for Irrigation, dated Fort Saint George, 11th March 1871, No. 72.

THE result of the examination of the water-shed near the Goodalore Ghaut is such as to render it necessary to make a further examination next season, and it is quite possible, though as yet not at all clear, that it may be found advisable to adopt the lower, rather than the higher, site for the works for bunding the

Perryaur and turning its waters into the Madura District. Possible alterations in the future need not, however, interfere with the completion of the estimates for the project in the form for which the necessary investigations have been made, and it will then rest with the Government to decide whether, on a comparison of the amount of the estimates and the returns expected from the outlay, it will be advisable to apply to the Government of India for the sanction of these estimates, or to wait until it has been ascertained whether a cheaper project can be worked out at a site 8 or 10 miles lower down the river.

2. Several considerations, besides the difference of height of embankment at the river or depth of cutting at, or length of tunnel under, the water-shed, will have to be taken into account, and among them facilities for silting will take a very important place. Apart from this there will no doubt be several advantages in selecting a site which will not only utilize a larger catchment basin, but which, lying below a comparatively open part of that basin, would secure a given quantity of storage capacity with a smaller depth of water.

3. Should the relation between the estimates for the upper sites and the revenue returns prove satisfactory, there would, in my opinion, be no objection to the submission of the former to the Government of India for sanction, in anticipation of the completion of the investigation of the lower site; because, if the latter should be ultimately adopted, it will only be so on the ground of its superiority, and when once the feasibility of the project and its value have been ascertained, it will be of great advantage not to delay the commencement of the execution of the works. The scheme will require the sanction of the Secretary of State as well as the approval of the Government of India, and the requisite references will take time, during which there will be an opportunity of finishing the examination of the lower site, and deciding whether it should be preferred to that estimated for. Probably one or two seasons would be gained by the adoption of the course suggested.

(Signed) J. MULLINS, Major, R.E.,
Chief Engineer for Irrigation.

No. 682. ORDER THEREON, 29th March 1871, No. 929.

IRRIGATION, No. 56-A.

THE Government approve of the proposals made by the Chief Engineer for Irrigation, in connection with the recently ascertained fact that the water-shed near the Goodalore Ghaut is relatively to the Perryaur about 15 feet lower than the saddle at which it has been hitherto intended to pass Perryaur water into the Surulyaur.

2. His Excellency the Governor in Council has noticed with satisfaction the wish of Lieutenant Christie to continue his employment on special duty until the completion of the further investigations, which have now been shown to be desirable; but, looking to the difficulty that would be felt in the Railway Department by his prolonged absence from his duties in the Consulting Engineer's Office, His Excellency considers that it will be better that this officer should join the latter as soon as the work on which he is at present engaged is finished. Should

5A

Proceedings of the Madras Government, Public Works Department,
29th March 1871.

Mr. R. Smith require the services of another Assistant Engineer at the commencement of the next healthy season on the hills, the Government will endeavour to make one available.

(True Extract.)

(Signed) J. G. RYVES, Captain, R.E.,
Acting Joint-Secretary to Government.

To the Superintending Engineer, 8th Division.
To R. Smith, Esq., Executive Engineer.
To the Chief Engineer for Irrigation.

Exd. S. T. Augustin.

Govt. of {1871} Madras.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER,

8TH DIVISION.

&c., &c., &c.

Dated March 29th,

Recd. *Encl.*

G. O., *29th March* 1871, *No.* 929.

MARCH

Nos. 681-682

Perryaur Project.—Passing orders on the memorandum by the Chief Engineer for Irrigation on the Progress Report of the Perryaur project for February 1871.

Recd the Coly: — 7th ? 1

No. 415 Special Executive Engineer's Office
Madura 8th March 1871.

No

From,

R. Smith Esquire
Executive Engineer, On Special duty
Madura District

To,

Major J. Mullins R.E.
Chief Engineer for Irrigation
Madras

Enclosures - 2
1 Table of Rain-fall & Discharge of Perriyaur.
1 Diagram. Do. Do.

Sir,

I have the honor to submit the usual monthly Report showing the progress made, with the Perryaur investigations, during February 1871. —

2. All work, connected with the detailed examination of sites Nos. 2 and 3, has been completed. Lieutenant Greer, who was in immediate charge of the operations in the Hill tracts, returned to Madura on the 7th Ultimo, and has since been

engaged.

engaged in working out the Cost of the Watershed tunnel and lake embankment at different levels. —

3. During my visit to the Perryaur, at the close of last year, I resolved on having the Watershed and Country adjacent to the Goodalore Ghaut examined, before submitting the estimate and designs for the Head Works, and assigned this duty to Lieutenant Christie. —

4. The results of this examination indicate that the Reservoir embankment should be constructed some 8, or perhaps 10, miles below our present proposed sites —

5. As the unhealthy season was close at hand Lieutenant Christie's investigations were necessarily very cursory but you will, I presume, consider from what has been ascertained that further

investigation

9A 2

investigation is necessary.

6. According to Lieutenant Christie's levels the fall, in the bed of the Perryaur, from the present Camp to the embouchure of the Stream on the right bank of this river, in longitude 77° 13', is 35.19 feet; and from this point, to about 3 miles farther down, there is very little if any slope. From the end of this level reach Lieutenant Christie took a section, about a mile in length, and found the fall to be 10 feet in this distance. He also examined the River for a mile or so lower down, and reports that there will be no difficulty in finding a suitable site, for the Lake embankment, in that locality.

7. Lieutenant Christie makes the crest of the Watershed, near Goodaloor, 49.75 feet lower than it is in the line of the

present

present proposed outfall from sites 2 and 3.

8. If the detailed investigations confirm the above results the Head works will probably cost less than they would do higher up - the risk during Construction, and subsequently, will be considerably reduced by having the Reservoir in this comparatively flat Country and the increased area of the Catchment basin will make the supply of water much more certain.

9. In November last experiments were made by Lieutenant Greer, at my request, to ascertain the proportion of silt brought down, by the Perryaur, during floods - annexed are the results:-

State of River	Level of River	Weight of silt brought down by one Cubic foot of water	Specific gravity of Silt	Cubical Contents of Silt brought down by one Cubic foot of water
Flood rising ———	5 feet	12 grs	2	0·02 inches
Top of flood ———	10 "	22 "	2	0·04 "
River falling ———	5 "	7 "	2	0·01 "

10. The table and diagram showing the rain-fall, at the Perryaur Camp, and the discharge of the Perryaur, during February 1871, accompany this Report.

11. Fair progress has been made with the designs for the works, on the North of the Vigay, and with the survey of the Distribution Channels. Subjoined is an abstract of the Field-work done, in the Plains, during the month under review:-

Lineal miles of Country Surveyed	Levelling operations Aggregate length of Longitudinal and Transverse Sections in Miles	Number of permanent Bench marks fixed	Number of trial pits sunk to the full depth
122	81	21	113.

12. In Conclusion I have to add that Lieutenant Christie has volunteered to

to remain on the Periyaur Staff, for a time, in the event of your considering it desirable to resume the investigations lately conducted by him, and I feel sure the Government will appreciate the spirit that prompted this offer and allow him to continue on Special duty.

I have the honor to be

Sir,

Your Most Obedient Servant

J. Smith

Executive Engineer

On Special duty

Madura Dist.

15 A

No. 415

From,

The Executive Engr.
On Special duty
Madura Dist.

To, The Chief Engineer
for Irrigation
Madras

Dated 8th }
Despd. 9th } March 1871.
Received 11 } W. 1346/71

Enclosures 2.

Submits the Monthly Report showing the progress made with the Perryaur investigations, during February 1871.

Perryaur Project

Table of Rainfall and Discharge of Perryaur during February 1871.

Date	Rainfall at Perryaur Camp. Inches	Hours	Water level in feet	Discharge: Cubic feet per Second	Discharge: 1000 Cubic yards per day
Feby 1.	0.00	6 am	0.30	396	1,267
		6 p.m.	0.30	396	
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3.	0.00	6 a m	0.20	372	1,173
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		6 p m	-0.28	273	
12	0.00	6 a m	-0.29	271	864
		6 p m	-0.30	269	
13.	0.00	6 a m	-0.30	269	1126
		12 noon	0.42	426	
		6 p m	0.15	361	
14.	0.00	6 a m	0.30	396	1286
		6 p m	0.35	408	

Date	Rainfall at Perryaur Camp. Inches	Hours	Water level in feet	Discharge: Cubic feet per Second	Discharge: 1000 Cubic yards per day
Feby 15.	0.00	6 a m	0.15	361	1102
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17	0.00	6 a m	-0.16	296	1,026
		6 p m	0.08	345	
18.	0.08	6 a m	-0.16	296	1,069
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		6 p m	-0.50	229	
27	0.40	6 a m	-0.52	225	749
		6 p m	-0.43	243	
28	0.20	6 a m	-0.33	263	842
		6 p m	-0.33	263	
Total	1.01			Total	27,78

Depth run off from Catchment Basin of 250 Square miles = 1.29 inches

Mean Discharge — 992,285 Cubic yards per diem
41,345 — " — " — " — hour.
310 — " — feet — " — Second.

	Cubic yards
Discharge of Perryaur in February 1871	27,784,000
Discharge of — Do — in February 1870	25,566,000
Difference – Excess in February 1871	2,218,000

Spl. Executive Engrs Office
Madura 8th March 1871. } Compd [illegible]

J. Smith
Executive Engineer
On special duty Madura Distt

Enclosure No. 1 in a Letter from the Executive Engineer, On Special duty, Madura Distt dated 8th March 1871.

No. 415

To,
The Chief Engineer
for Irrigation
Madras

PW 114 6/71

Perryaur Project

Table of Rainfall and Discharge of Perryaur during February 1871.

No 72

The result of the examination of the watershed near the Goodalur ghaut is such as to render it necessary to make a further examination next season, and it is quite possible, though as yet not at all clear, that it may be found advisable to adopt the lower, rather than the higher, site for the works for bunding the Peryaur and turning its waters into the Madura District. Possible alterations in the future need not however interfere with the completion of the estimates for the project in the form for which the necessary investigations have been made, and it will then rest with the Government to decide whether, on a comparison of the amount of the estimates and the returns expected from the outlay, it will be advisable to apply to the Government of India for the sanction of these estimates, or to wait until it has been ascertained whether a cheaper project can be worked out at a site 8 or 10 miles lower

down

down the river.

2. Several considerations, besides the difference of height of embankment at the river or depth of cutting at, or length of tunnel under, the water-shed, will have to be taken into account, and among them facilities for silting will take a very important place. Apart from this there will no doubt be several advantages in selecting a site which will not only utilize a larger Catchment basin, but which, lying below a comparatively open part of that basin, would secure a given quantity of storage capacity with a smaller depth of water.

3. Should the relation between the estimates for the upper sites & the Revenue returns prove satisfactory, there would, in my opinion, be no objection to the submission of the former to the Government of India for sanction, in anticipation of the completion of the investigation of the lower site; because, if the latter should be ultimately adopted it will only be so on the ground of its superiority, and when once the feasibility of the project and

its

its value have been ascertained, it will be of great advantage not to delay the commencement of the execution of the works. The scheme will require the sanction of the Secretary of State as well as the approval of the Government of India, and the requisite references will take time, during which there will be an opportunity of finishing the examination of the lower site, and deciding whether it should be preferred to that estimated for. Probably one or two seasons would be gained by the adoption of the course suggested.

Fort St. George
11th March 1871

John Mullins Major R.E.
Chief Engineer for Irrigation

To
The Secretary to Government
P.W. Dept.

P.W. 1871 Deps for March
From Prog^s of Proce^dgs No 1140.
The Chief Engineer
for Irrigation

To
The Secretary
to Gov^t P.W.D.

Dated 11th } March 1871
Desp^d 13th }
Recd " } 2 E. h... s

No 72

Enclo^s 3. Plans

Memo on the Chenab...
-aun progress Report
for the month of Feby
1871

No 929 - 29th July 71.

No 681

6 15 March 71 A. 16a

Public Works Department

No. 929

Proceedings of the Madras Government

Read the following

From

The Chief Engineer for Irrigation } (H. E. No. 72 d/ 11th March 1871)

N.

The Government approve of the proposals made by the Chief Engineer for Irrigation, in connection with the recently ascertained fact that the watershed near the Goodaloor Ghaut is relatively to the Perryaur about 15 feet lower than the saddle at which it has been hitherto

hitherto intended to
pass Porryaur water
into the Sarelyaur.

2. His Excellency
the Governor in Council
has noticed with sa-
-tisfaction the wish of
Lieutenant Chrystie
to continue his em-
-ployment on special
duty until the com-
-pletion of the further
investigations, which
have now been shewn
to be desirable; but,
looking to the difficulty
that would be felt
in the Railway De-
-partment by his
prolonged

prolonged absence from his duties in the Consulting En=gineers' Office, His Excellency considers that it will be better that this Officer should join the latter as soon as the work on which he is at present en=gaged is finished. Should Mr. R. Smith require the services of another Assistant Engineer at the commencement of the next healthy season on the hills, the

the Government will endeavour to make one available.

Wy. 13/3/71

WAE

25

Despd 30/3/71

To

1. The Supg Engr of the S. Divn

2. To R. Smith Esqre. Ex: Engineer

3. " the Chief Engineer for Irrigation

" C. Engr for Railways

Pro 6th March /71 Nos 120 - 121

28A

Further Pro: No 1400 of 22-8-71

No. 1161

Govt. of {1871} Madras.

PUBLIC WORKS.

To The Superintending Engr.
8th Division

Dated

Recd. No. 3

G. O. 29th Mar. 1871, No. 929.

Nos. 681-682

Perriyaur Project. Passing orders on the Memo. by the Chief Engr. for Irrign. on the prog. report of the Perriyaur Project for Feb/71.